

REMARKS

The Applicant has carefully considered this application in connection with the Examiner's Action and respectfully requests reconsideration of this application in view of the foregoing amendments and the following remarks.

I. Objections

The Examiner objected to the use of “one” on Line 8 in Claim 1. In response, Claim 1 has been amended to recite –on– as suggested by the Examiner.

The Examiner objected to the use of “substrate” in the preamble of Claim 1 while the term “printed circuit board” is used in the body of the claim. In response, the preamble and body of the claim have been amended to recite “substrate” so as to match each other.

Therefore, the Applicant respectfully requests the Examiner to withdraw the objections and pass these claims to issue.

II. Rejection of Claims 1-14 and 21-24 under 35 U.S.C. §112 first paragraph

The Examiner has rejected Claims 1-14 and 21-24 under 35 U.S.C. §112 first paragraph as failing to comply with the written description requirement by including the term “trace.” In response, the term “trace” has been replaced with the term “interconnect,” as suggested by the Examiner. Therefore, the Applicant respectfully requests the Examiner to withdraw the 35 U.S.C. § 112 first paragraph rejections and pass these claims to issue.

III. Rejection of Claims 1-14 and 21-24 under 35 U.S.C. §103(a)

The Examiner has rejected Claims 1-14 and 21-24 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,254,758 to Koyama ("Koyama") in view of U.S. Patent No. 6,015,482 to Stern ("Stern"). The Applicant respectfully maintains that the claimed invention is not obvious in view of the foregoing combined references, and this combination fail to establish a *prima facie* case of obviousness of Claims 1-14 and 21-24.

The combination of Koyama and Stern, for instance, fails to teach or suggest all of the elements of the invention recited in independent Claims 1 or 8. For instance, Claim 1 recites removing a portion of each of the first and second plating layers from the first and second dielectric layers while leaving the portions of the first and second plating layers under the first and second contact layers. In contrast, Koyama only teaches the general notion of etching an electroless copper plated layer 12 exposed by using a special etching solution (Column 2, Lines 34-37). The Applicant can find no teaching or suggestion in Koyama corresponding to the above-cited elements of Claim 1. Koyama's build-up method, shown in FIGUREs 5(a) to 5(e), for example, discusses the formation of conductor patterns 20a and 20b, but not removing a portion of these layers from first and second insulating layers, while leaving portions of conductor patterns 20a and 20b under first and second contact layers. Likewise, Stern simply states that copper foil 14 not encompassed by tin-nickel layer 22 can be etched or removed from the substrate 12 as shown in FIGURE 2F.

As such, there is no teaching or suggestion of removing a portion of each of the first and second plating layers from the first and second dielectric layers while leaving the portions of the first and second plating layers under the first and second contact layers by the combination of Koyama and Stern. If the Examiner continues to believe that such a teaching or suggestion does exist, then

the Applicant would appreciate it if the Examiner could point out specifically where this can be found in either of these two references.

In addition, the asserted combination of Koyama and Stern, fails to establish a *prima facie* case of obviousness because the asserted combination is improper. The combination of Koyama and Stern is improper because a person having ordinary skill in the art would not be motivated to add the teachings or suggestions of Stern to Koyama because Stern does not address Koyama's goals forming a conductor pattern that can be simplified and reduces the interval between the conductor patterns (Column 2, Lines 20-24).

Contrary to the Examiner's assertion, Koyama has no reason or motive to form gold contacts on copper. Rather, as clearly presented in Koyama's background section (Column 1 Line 14 to Column 2 Lines 14), Koyama wishes to simplify the process for forming conductor patterns and to reduce an interval between the conductor patterns to a limit of resolution of the plated resist. Koyama considers conventional processes unsatisfactory because side portions of electrolytic copper plated layer 16 are etched when using conventional etchants in combination with an etching resist 18 (FIGURES 6(a) - 6(g)). Koyama dispenses with an etching resist in favor of a special etchant of sulfuric acid, hydrogen peroxide and Cu chelating agent, that removes an electroless copper plated layer in favor of an electrolytic copper plated layer (Column 2 Lines Lines 24-37).

Stern, in contrast, teaches the use of a nickel-tin etch resist 22 and copper etchant of ammonium hydroxide or ammonium chloride (FIGURE 2F; Column 6, Lines 24-27). There is nothing in Stern to indicate that this process wouldn't also remove side portions of Stern's electrolytic copper plated layer 18. Moreover, Stern must retain the nickel tin resist 22 in order to provide a suitable adhesive surface for gold (Column 6, Line 59-60). Therefore, the Applicant

respectfully submits that one of ordinary skill in the art would have no motive to combine Koyama and Stern, because Stern teaches the very type of conventional process that Koyama is trying to avoid. In fact, the Koyama reference teaches away from such a combination. The Applicant respectfully submits that the combination of Koyama and Stern requires the improper use of hindsight.

Because the combination of Koyama and Stern does not teach or suggest all elements of independent Claims 1 and 8, and the combination is improper, they fail to establish a *prima facie* case of obviousness with respect to independent Claims 1 and 8 and their respective dependent claims.

IV. Allowable Subject Matter

The Examiner has indicated that dependent Claims 5, 6, 12 and 13 are allowable, if rewritten in independent form and the above described rejections under 35 U.S.C. 112 are overcome. The Applicant wishes to express appreciation for this indication of allowable subject matter, but as noted above, independent Claims 1 and 8 and their respective dependent claims are not rendered obvious by the references of record. Accordingly, the Applicant respectfully requests the Examiner to find all of Claims 1-14 and 21-24 allowable.

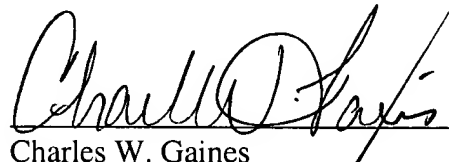
V. Conclusion

In view of the foregoing amendments and remarks, the Applicant now sees all of the Claims currently pending in this application to be in condition for allowance and therefore earnestly solicits a Notice of Allowance for Claims 1-14 and 21-24.

The Applicant requests the Examiner to telephone the undersigned attorney of record at (972) 480-8800 if such would further or expedite the prosecution of the present application.

Respectfully submitted,

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